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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR APRIL 1935

Vol. II, No. 6 (Not for publication) June 1, 1935

APPROPRIATIONS FOR THE BUREAU

On April 17 the President signed an act making appropriations to the Department of Agriculture for the fiscal year 1936. The appropriations include $7,891,421 for the Bureau of Entomology and Plant Quarantine. Of this amount the following sums were made immediately available: $2,500,000 for chinch bug control; $480,000 for screw worm control; $261,156 for Dutch elm disease eradication; and $1,000 for the study of azalea insects.

FRUIT INSECT INVESTIGATIONS

Aluminum paint increases effectiveness of tin traps for Mediterranean fruit fly.--O. C. McBride, of the Bureau's fruit-fly laboratory at Honolulu, Hawaii, reports that several years ago the Mediterranean fruit fly trap in most common use was made of tin. Under Hawaiian conditions the tin rusted very quickly. A glass trap was found to be much more satisfactory. More recently it has been found that the tin traps could be maintained in good condition by coating them with aluminum paint; also that the aluminum-painted traps for some reason or other are more effective, capturing on the average more than twice as many male flies as do the glass traps. Kerosene is being used as the bait in all of these traps but it is not attractive to females.

Delayed effect of lime-sulphur on San Jose scale.--Oliver I. Snapp and J. R. Thomson, of the peach-insect laboratory at Fort Valley, Ga., have found that the effect of applications of lime-sulphur during the dormant period for the control of the San Jose scale was not fully evident until several months after the spraying was done. The data obtained in last winter's experiments are given in the following table.

Treatment (December 15)	Average percentage of scale alive			
	Before spraying on Dec. 15	One month after spraying	Three months after spraying	Four months after spraying
Liquid lime-sulphur (Baume 32.6) 1 part to water 6 parts----	86.33	67.66	43.83	10.0
Liquid lime-sulphur (Baume 32.6) 1 part to water 7 parts----	87.33	77.0	49.66	21.5
Liquid lime-sulphur (Baume 32.6) 1 part to water 8 parts----	87.17	79.66	51.83	33.2
Check - untreated----	85.83	86.33	80.83	(1/)

1/ Twice-stabbed ladybeetles (larvae and adults) cleaned up scale on check trees between March 15 and April 15.

It is evident that final counts to determine the mortality resulting from the application of liquid lime-sulphur should not be made until several months have elapsed. Counts made 1 month after the application cannot be depended on for reliable conclusions.

Mulberry shade trees and the raisin moth in the San Joaquin Valley.--H. C. Donohoe, of the dried-fruit insect laboratory at Fresno, Calif., reports that mulberries have been planted extensively for shade trees in the fruit-producing districts of the San Joaquin Valley. Mulberries fruit in the early spring before other food crops for the raisin moth, such as apricots, first-crop figs, and peaches, ripen. During the same period the raisin moth emerges from hibernation and fallen mulberries lying in the shade under the trees become heavily infested. An estimate of 1,120,000 developing larvae has been obtained from the fruit under one tree. The raisin moth attacks all of the dried fruits produced in the San Joaquin Valley. The infestation occurs in the field, the moths laying their eggs on the fruit largely while it is drying in stacked trays and in boxes on the ranches. In the 1932 fig crop the losses from insect attack, largely by the raisin moth, were estimated at $216,000.

DATE SCALE CONTROL

Clean-up work in Arizona completed.--All previously infested palms of record have been trunk-pruned and all seedling jungles within the infested areas have been thinned and pruned, so that effective inspection is possible. Inspection in the infested area in the Imperial Valley was continued during the month and no scale was found. No scale has been found in the valley, except in one planting, for 2 years. In the Coachella Valley 789 palms were pruned to facilitate inspection. A total of 1,419 palms were inspected and no scale was found. Offshoot cutting is under way and 2,661 offshoots were inspected and certified as free from Parlatoria scale. Most of these offshoots are planted locally but some are shipped out of the regulated area. One shipment was sent to South Africa and one to Palestine.

MEXICAN FRUIT FLY CONTROL

Work progresses in lower Rio Grande Valley.--The harvesting season for citrus fruits in the lower Rio Grande Valley closed at midnight, April 2. Very little commercial fruit was left on the trees at that time. The tree-to-tree inspections started immediately and the greater part of the area was cleaned before the middle of the month. Two larval infestations were found during the clean-up period. Trapping was continued throughout the month and 65 adult Anastrepha ludens, 300 A. pallens, 2 A. fraterculus auct., and 15 A. sp. "Y" were taken during the month in the valley area. Three adult A. ludens were trapped in Webb County and 12 in Brooks County. In these two counties and in Jim Wells County 23 A. pallens and 1 A. sp. "Y" were taken. Three adult A. ludens were trapped in Matamoros and 2 A. sp. "Y" were taken in the brush south of that city. Larvae of A. ludens taken from market fruit in Matamoros and Reynosa totaled 682. In market fruit in Matamoros 3 larvae identified as Anastrepha sp. not ludens were collected. Two spraying outfits operated throughout the month. Nicotine-sulphate-molasses spray was applied to 34,743 trees on 75 premises.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Grasshopper eggs overwinter in good condition in Montana.--According to J. R. Parker, Bozeman, Mont., in March large quantities of eggs of Camnula pellucida Scudd., Melanoplus bivittatus Say, and M. mexicanus Sauss. were dug from the ground in Sweetgrass County in south-central Montana and were brought to the laboratory to rear grasshoppers for bait experiments. Nearly a 100-percent hatch was obtained whenever these eggs were held at a temperature of 80° F. for a period of 10 days. This indicates that winter conditions have been favorable for egg survival and that a normal hatch may be expected as soon as hatching temperatures occur.

Number of instars varies in economic species of grasshoppers.--R. L. Shotwell, Bozeman, reports as follows: Most of the species of grasshoppers observed went through from five to six instars in their nymphal development. The percentages of all the males and all the females for each species going through five instars and those going through six instars are given in the following table. This table also includes the number of individuals of both sexes upon which these percentages are based. In practically every case a much greater percentage of the females went through six instars than of the males. Melanoplus femur-rubrum DeG., reared from eggs collected in Tennessee almost invariably went through six instars, whereas a greater proportion of those from Montana went through five. M. differentialis Thos. is not included, because the records showed that it invariably went through six instars.

Species	Total individuals: Male	Total individuals: Female	Five instars: Male	Five instars: Female	Six instars: Male	Six instars: Female
	Number	Number	Percent	Percent	Percent	Percent
M. bivittatus	244	241	93.0	59.3	7.0	40.7
M. mexicanus	18	15	77.8	60.0	22.2	40.0
M. femur-rubrum (Montana)	78	95	97.4	96.8	2.6	3.2
M. femur-rubrum (Tennessee)	27	20	0.	10.0	100.0	90.0
M. packardii	77	57	92.2	71.9	7.8	28.1
Dissosteira carolina	119	115	96.6	78.3	3.4	21.7
M. gladstoni	1	9	100.0	77.8	0.	22.2
Camnula pellucida	28	35	100.0	97.1	0.	2.9

Nemic parasite of corn ear worm discovered.--W. H. Larrimer, of the Rosslyn, Va., laboratory, reports as follows: "This parasite was first taken from the hibernation experiment with the corn ear worm at Moorestown, N. J., and has proved to be a very interesting find. As it was discovered in early winter, the observations have necessarily been confined to the laboratory. It has been determined by G. Steiner, of the Division of Nematology of the Bureau of Plant Industry, as a new species of *Neoaplectana*, but has not yet been described. Technique has been developed for experimental infection of various hosts under laboratory conditions. Corn ear worms are readily infected. Mortality of the host occurs in from 1½ to 2 or 3 days, depending on the size and stage of development of the ear worms and the number of free-living nemas infecting the individual worm. A complete cycle of the nema from egg to adult takes approximately 1 week. Eggs develop, are fertilized, and have been observed to hatch within the female nema, the young worms causing the death of the mother and finally rupturing the body wall and escaping after devouring the body contents. From 8 female nemas approximately 1,000 young developed, an average of 125 per female, and a range of from 18 to 220. Under conditions not yet understood, the body wall of the female nema ruptures and the ovaries and eggs are exposed before the eggs hatch. Extreme drying out seems to be fatal to the nema larvae, although they roll up in ropes or balls for protection when there is a shortage of moisture. Unlike other closely related nemas, *Neoaplectana* sp. is not at all specific in its host requirements. In addition to the corn ear worm, the entire life cycle of the nema, from free-living form to free-living form, has been reared on the larval stages of the fall armyworm, the spotted cutworm, the common cutworm (*Feltia ducens*), the housefly [1] and the alfalfa weevil. Other hosts that are now being tested include various species of white grubs, cutworms, wireworms, and the codling moth. Attempts made in cooperation with the Division of Nematology of the Bureau of Plant Industry to rear this species on artificial media have not been successful to date. Veal-dextrose-yeast-agar has been tried in various combinations and densities without success. Free-living forms remained alive and infective in tap water from late in December 1934 to March 31, 1935."

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[1] Material furnished through the courtesy of Dr. Sullivan, of the Takoma Park laboratory.

Disease and parasitization in army cutworm.--H. H. Walkden, Manhattan, Kans., reports that rearings of larvae of this species, collected in March in various localities in Kansas, have shown a high mortality from disease and parasitization. The table shows the comparative conditions for the localities from which collections were made, also the average for the State.

Locality	Larvae observed	Healthy larvae	Larvae parasitized	Larvae killed by wilt	Larvae killed by fungous disease
	Number	Percent	Percent	Percent	Percent
Manhattan----	80	65	11	8	16
Ellsworth----	112	14	12	29	45
Bucklin------	77	52	23	9	16
Coldwater----	107	8	10	68	14
Average------	--	31	14	32	24

Many of the larvae showed symptoms of wilt disease at the time of collection and the most common fungus was the green muscardine.

Birds fond of pea aphids.--According to E. T. Jones, so much difficulty was experienced in maintaining a population of pea aphids on alfalfa plants being tested for resistance in plots in the field and in plats on the laboratory grounds at Manhattan, that it was found necessary to cover the plants with a screen-wire cage to keep out the birds. The birds were so eager to obtain the aphids for food that they kept the alfalfa plants cleaned.

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Prevention of decomposition of derris by light.--Reporting further on the decomposition of derris, L. D. Goodhue, Moorestown, N. J., says: "The materials listed in the table below have been added to derris in an attempt to retard its normal rate of decomposition. Because of the varying amount of sunlight during any period of exposure, each group of determinations included derris with blown fish oil for a standard of comparison. The values in the last two columns give the number of times more active derris remained on the plate of treated derris than that on plates sprayed with derris and blown fish oil. For example, plates sprayed with white pyroxylinenamel and derris had 5 times more active derris, after 5 days' exposure, than plates sprayed with derris and blown fish oil. The comparison is made in the same way for the 10-day period.

Material added	Percentage[1]	Sticker	Exposure	
			Five days	Ten days
White pyroxylin enamel	100	Pyroxylin	5.0	3.5
White pyroxylin enamel	100	do.	3.6	5.7
Lampblack on dry derris	10	Agar-agar	4.5	4.8
Casein	50	Casein	3.9	2.4
Rosin residue plus asphalt 50-50	100	Rosin asphalt	3.5	3.5
Lampblack	10	do.	3.1	2.5
Agar-agar	25	Agar-agar	2.7	2.5
Rosin residue	100	Rosin residue	2.5	2.5
Liquid asphalt in blown oil	50	Blown oil	2.5	1.2
Asphalt emulsion	100	Asphalt	2.5	1.7
Black pyroxylin enamel	100	Pyroxylin	1.9	3.2
Lampblack on dry derris	10	Blown oil	1.8	1.5
Pyrogallol in blown oil	5	do.	1.5	1.3
Black pyroxylin enamel	100	Pyroxylin	1.4	1.4
Lampblack in oil	10	Blown oil	1.2	1.1
Lampblack on dry derris	15	do.	1.1	.9
Black paper dye on derris	--	do.	1.1	2.6
Green paper dye on derris	--	do.	.7	1.4
Green pyroxylin enamel	100	Pyroxylin	.8	1.2
Lampblack dry on derris	20	Blown oil	.55	.6
Lampblack in oil	10	do.	.5	.6
Green dye, water soluble	--	do.	.35	.5

[1] Based on quantity of derris.

"The average amount of active derris remaining on glass plates sprayed with derris and blown fish oil is close to 10 percent after 5 days' exposure. With agar or casein as a sticker, about 30 percent remains at the end of the same period. This seems to indicate that the derris is extracted by blown oil, thus bringing the active principle into a transparent medium where it will be easily decomposed by light. A laboratory test shows that derris is readily extracted by blown fish oil. This property disqualified the blown oils for use with derris regardless of their excellent sticking properties. The addition of dry pigments to derris or the application of dyes gives no protection when blown fish oil is used as a sticker. Blown fish oil and asphalt appear to be better than the blown oil alone. When a sticker such as casein or agar, which does not extract the derris, is used some added material to protect it from the light does cut down the rate of decomposition. Lampblack with agar or white pigment in pyroxylin enamel are examples. The rate of decomposition with rosin residue is less than when blown fish oil is used as a sticker."

Treatment of balled and potted plants to destroy immature stages of Japanese beetle.--J. W. Lipp, Moorestown, says that plants treated at Whitesbog by plunging for 5 days in soil containing 10 pounds of paradichlorobenzene per cubic yard, included 6 varieties of blueberry (Rubel, Pioneer, Cabot, Concord, June, and Jersey), franklinia, magnolia, and American holly. Since the expiration of the treatment the plants, which were heeled into open ground, have been examined several times. The treated plants have suffered no apparent injury, with the possible exception of the holly, the leaves of which show signs of darkening and dropping. However, as a similar condition exists on the untreated plants, kept indoors in untreated soil for 5 days, the treatment cannot be considered responsible. The wood of the treated and untreated holly plants is equally good. Preliminary tests with surface applications of soil containing 50 pounds paradichlorobenzene per cubic yard of soil to potted azaleas indicate that a complete kill of grubs in either 3-inch of 4-inch pots can be obtained with exposure for 9 days or longer and in 5-inch pots for 13 days. In these tests the treated soil was applied to the top of the pot only, as compared with the present recommended method of plunging the pot ball in treated soil. By this new method it may be possible to treat potted plants without the necessity of first removing the pot and replacing the plant in the pot after treatment.

JAPANESE BEETLE CONTROL

Violator of Virginia Japanese beetle quarantine fined.--Termination of the project's first prosecution under the Virginia crop pest law for a violation of the State Japanese beetle quarantine has resulted in a fine of $25 and costs. The violation involved intrastate movement from Richmond to Ellerson on November 17, 1934, by J. H. Thompson of 1,125 seedlings and 275 perennial plants. The uncertified plants had been shipped via express to Richmond from Bristol, Pa., a point heavily infested with the Japanese beetle. H. B. Ward, district supervisor in Richmond, appeared before the Hanover County grand jury on March 18 and a true bill was returned. On April 19 the defendant appeared in the circuit court and pleaded guilty, with the resulting fine.

Twenty-one inspectors added to road-patrol force.--Strengthening of the Japanese beetle road patrol was accomplished by the establishment in April of 15 additional stations, manned by a corps of 21 inspectors. Ten of the stations are operated on a daily staggered schedule of 8 hours. The four posts already in operation in Virginia were supplemented by 4 additional stations opened early in April. Patrols were posted on 5 highways leading from the regulated area into West Virginia. On the Pennsylvania-Ohio State line 5 posts were opened. Although most of the posts were in operation for only half of April, 13 Japanese beetle grubs were removed from soil about the roots of plant material intercepted and certified at the highway stations. Among infested contraband intercepted, were 3 peony plants containing 3 larvae en route from Wilmington, Del., to Richmond, Va.; 1 potted plant also containing 3 larvae being transported from Philadelphia, Pa., to Boggs Run, W. Va.; and 2 violet clumps in the possession of a motorist from Washington, D. C., going to Petersburg, Va.

Nursery inspections at peak.--Japanese beetle certificates issued in the Philadelphia district in the first half of April exceeded any semimonthly issuance of last year. From April 1 to 15, 12,939 certificates of all types were used by classified establishments. Last year the largest number issued was 9,653. On April 9 last, 2,046 certificates were issued, the highest number for any one day this year. Corn borer certificates issued tripled over the previous semimonthly period. It was necessary to assign an additional inspector to one large nursery in the Philadelphia area to take care of the Easter rush.

Autogiro tested for aerial scouting for Dutch elm disease.--Two experimental observation flights by autogiro were made late in April to determine the feasibility of aerial scouting for trees infected with the Dutch elm disease. On April 25 a half-hour flight was made by one observer from a field near Willow Grove, Pa. Two half-hour flights with different observers were made on April 30 from Roosevelt Field, on Long Island. The maneuverability of the ships at low speeds and altitudes was particularly noted. The autogiro is able to cruise from 150 to 200 feet from the ground, at speeds less than 40 miles per hour. By flying into a good wind the ship may be held almost stationary over a tree top, giving ample time to determine wilting or other symptoms. Visibility at the low altitude is about one-quarter mile. Results of these two flights are considered satisfactory enough to justify at least a short trial period in actually scouting infected and adjacent territory.

Dutch elm disease eradication accomplishments.--Trees eradicated during April totaled 91 diseased elms and 155,996 dead and dying trees. Scouts systematically covered 479.7 square miles in the work area and tagged an additional 223,627 dead and dying elms. Since the beginning of the current sanitation campaign 392,420 dead and dying trees have been cut down and destroyed. There remain standing 402,762 dead and dying specimens tagged for removal. There were 10 confirmed trees standing at the end of the month, awaiting State action to clear them for removal.

FOREST INSECT INVESTIGATIONS

Large control project nears completion.--F. P. Keen, of the Portland, Oreg., laboratory, reports that on the Warm Springs Indian Reservation of eastern Oregon the Indian Service, using Indian C. C. C. labor, will soon complete the disposal of western pine beetle infestation over the largest continuous area of ponderosa pine forest ever treated in such work. Practically the entire ponderosa pine type of the Warm Springs Reservation, or approximately 65,000 acres, has already been covered and 15,000 infested trees have been felled, peeled, and burned. Inspection showed that the character of the work was uniformly excellent.

Ips beetles raise havoc in experimental thinnings.--Mr. Keen also reports that a stand of even-aged, 46-year-old ponderosa pine was carefully thinned to an 8 by 8 foot spacing. The slash was left on the ground and developed large broods of Ips beetles which, upon emerging in the fall, attacked the green trees and killed such a high percentage of them as to destroy the value of the thinning experiments. Similar damage was widespread throughout the pine forests of Oregon during 1934, wherever logging operations, C. C. C. road development, and other cutting of timber left quantities of slash to serve as breeding material for Ips beetles.

Mountain pine beetle adults reemerge in sugar pine.--Studies on the habits of adult beetles by G. R. Struble, of the Berkeley, Calif., laboratory, during July and August 1934, near Northfork, Calif., indicate that the extent of emergence of adults is influenced by overcrowding and host resistance. Tests were made by forcing new adults to attack 3 caged green logs and a caged portion of a green tree. The results obtained from green logs showed the same emergence from logs attacked by 10 and 20 beetles per square foot of bark area, while the emergence from a log attacked by 40 beetles per square foot of bark area was five times as great. All emerged beetles reattacked green logs and laid eggs; however, in a standing green tree attacked by 30 beetles per square foot the number of adults that emerged was negligible. Such evidence indicates that in sugar pine the second attack of reemerged adults may be a factor only during epidemic conditions, when overcrowding occurs because of lack of host material. Records of brood development during the past season show that a general decline in infestation was evident in 1934, as compared with the two previous seasons. The reason for this could not be ascertained.

Third generation of western pine beetle complicates control work in northeastern California.--According to K. A. Salman, Berkeley, forest-insect control crews in the Lassen National Forest found it necessary to treat approximately twice as many overwintering brood trees as had been expected from estimates based on results of plot surveys late in September. To date (May 10) 136 trees per section have been found to contain overwintering brood on the Blacks Mountain project and 495 trees per section is the average for the Little Valley area. Fully two-thirds of the overwintering trees were found to have been attacked late in the fall and two-thirds of the total number of trees infested during the entire year contain overwintering brood. Explanation of these unusual conditions is furnished by results of the brood studies carried out on the Modoc National Forest during 1934. It was found that over half of the population in trees infested by the second generation of the western pine beetle emerged before winter to attack as a third generation. This is a much greater emergence of second-generation brood than occurs normally. Sufficient brood remains in most second-generation trees to warrant treatment as overwintering broods. This combination of circumstances has made it necessary to treat the unusually large number of third-generation trees and practically all of the second-generation trees.

Salvage logging plans given impetus by heavy losses from beetle attacks.--Dr. Salman also reports that continued heavy infestations by the western pine beetle in ponderosa pine stands of the Shasta, Modoc, Lassen, and Plumas forests of northeastern California have compelled lumber companies operating in those areas to use special methods in logging infested trees as a means of reducing infestations and salvaging timber.

Elm bark beetle experiments.--D. L. Parker, of the Morristown, N. J., laboratory, reports regarding experiments in which sticks of elm were submerged in water to determine the effects of this treatment on the larvae of

Scolytus multistriatus Marsh. present in the sticks. The sticks ranged from 1¼ to 4¼ inches in diameter and were from 10 to 12 inches long. Approximately half of the sticks were floated on water and the remainder were completely submerged in water in a greenhouse when they were brought in from outdoors on January 4, 1935. The floating sticks gradually sank and at the end of 2 weeks all were submerged. On March 8 some of the sticks were removed from the water and placed in battery jars. Adults of *S. multistriatus* have since issued in the jars.

Notes on parasites.--P. B. Dowden, of the Melrose Highlands, Mass., laboratory, reports that 200,000 hibernating larvae of the larch case bearer were received early in April from W. F. Sellers of the Hyeres, France, laboratory. This material was collected at Feitzer-Kanzel, Austria. The first parasites appeared on April 26 and between that date and April 30 the following had issued.

Parasite	Males Number	Females Number	Total Number	Remarks
Chrysocharis laricinellae (Ratz.)-	3,667	1,951	5,618	Primary
Cirrospilus vittatus Walk----------	--	--	177	Primary and secondary
Cirrospilus pictus Nees-----------	--	--	87	Primary and secondary

The first colony of *Chrysocharis laricinellae*, consisting of 1,100 males and the same number of females, was liberated at Woodstock, Conn., on April 30. Mr. Dowden also reports that a colony of 29 males and 45 females of the tachinid *Lypha dubia* Fall. was liberated in an infestation of the European pine shoot moth at Branford, Conn., on April 12. These parasites were received as puparia from Austria during the summer of 1934. *Schizonotus sieboldi* Ratz., a parasite of the willow leaf beetle (*Plagiodera versicolora* Laich.), definitely overwinters as an adult. A number of active adults were removed from hibernation cages. P. A. Berry, of the Melrose Highlands, Mass., laboratory, reports that hibernating adults of *Ephialtes examinator* (Fab.), an imported parasite of the European pine shoot moth, will oviposit freely in pupae of the forest tent caterpillar.

GYPSY AND BROWN-TAIL MOTH CONTROL

Gypsy moth work in barrier zone.--The gypsy moth work in 18 C. C. C. camps, east of the barrier zone in New England, was continued throughout the month. The crews were cut during the first part of the month, owing to the new enrollment period. The men continued doing creosoting, cleaning, and burning work, in addition to scouting. During April this work resulted in the creosoting of 81,681 gypsy moth egg clusters, the cleaning of 50 acres where infestation existed, and the scouting of 61,825 acres of woodland and open country.

PLANT DISEASE CONTROL

Educational work in barberry eradication.--In preparation for the 1935 survey and eradication season in Indiana, W. E. Leer, in charge of barberry-eradication work in that State, and his assistant have given illustrated talks to school children in all of the rural and many of the city schools in about 20 counties. In this way they reached 703 grade and 83 high schools, with a total attendance of 45,400 pupils. Since the beginning of this type of work in Indiana, demonstrations have been given in more than 1,000 grade schools and 650 high schools, with the result that children have reported approximately 125 scattered infestations of barberry. Frequently reports of a single bush have led to the eradication of many others when surrounding territory was inspected by the survey crews. A brief circular, prepared particularly for distribution to school children and containing a request for the cooperation of school officials in connection with the barberry-eradication program, was mailed recently to each school superintendent in Ohio. Harry Atwood, in charge of the eradication program in that State, reports a response from more than 80 percent of the people who received copies of the circular. During the past year 450 Ohio teachers have written the barberry-eradication office at Columbus requesting teaching material relating to the control of stem rust. During 1934 55 new barberry infestations were reported by school children, resulting in the eradication of more than 3,400 barberry bushes.

Local cooperation in blister rust control.--Up to 1934, inclusive, local cooperation has been excellent, as evidenced by 1,685 town appropriations totaling $470,270.40, and by 30 county appropriations of $7,474.64, in addition to the cooperation of 40,459 individual owners who expended $472,070.60, or its equivalent in labor, to eradicate Ribes on their properties. Thousands of additional owners of pine permitted the destruction of their cultivated Ribes bushes without compensation. This year 65 towns in New Hampshire and Maine have appropriated $15,625 for control work and 7 additional New Hampshire towns have signified their intention of setting aside some unemployment funds for blister rust control work.

White-stemmed gooseberry eradicated by use of powder.--T. H. Harris, Oakland, Calif., reports that powder is being used satisfactorily in the eradication of Ribes inerme found growing in meadow land and along the borders of some of the slower moving streams in certain parts of the sugar pine belt of the northern Sierra Nevada of California. In these locations this species of Ribes grows inextricably intermingled with willows and other species of brush in dense thickets.

Survey to determine practicability of blister rust control in Colorado and Wyoming.--A pine-Ribes survey of forest lands in Colorado and Wyoming was initiated in 1934 and will be continued during 1935. There are about thirty million acres of forest land in Colorado and Wyoming, most or all of it within the boundaries of 24 national forests, 3 National parks, and 1 Indian reservation. The results of the survey indicate that there are over four and one-quarter million acres of forest land on 12 national forests, 3 national parks, and 1 Indian reservation supporting white pine and that over one-half million acres of this area support comparatively valuable white pine stands. It is estimated that the completed survey will show that there are in the two States approximately one million acres which support stands of white pine of relatively high value. Within the stands of white pine already examined, 11 species of Ribes were found. In upland types from 1 to 38 Ribes bushes per acre were found, while in the moist stream bottoms the number ranged from 18 to 279.

Eradication season opens in southern Appalachian region.--Blister rust control work in the southern Appalachian States for the 1935 Ribes-eradication season has gotten off to a good start. In Maryland, 105,000 wild Ribes and 475 cultivated Ribes were destroyed during April on 10,405 acres of land. Virginia reports 28,916 acres on which 40,055 wild Ribes and 4,498 cultivated Ribes were eradicated by crews from four C. C. C. camps working in the Shenandoah National Park and the George Washington National Forest, and by P. W. A. laborers in the counties of Washington, Carroll, Giles, and Rockbridge. A smaller amount of Ribes-eradication work was also carried on in North Carolina, with 14,175 acres worked and 474 bushes destroyed; South Carolina, with 23,600 acres worked and 289 bushes destroyed; and Tennessee, with 1,366 acres worked and 205 Ribes removed. Most of these Ribes were cultivated bushes. In West Virginia a crew from a C. C. C. camp has been engaged in the eradication of Ribes from around the United States Forest Service Nursery at Parsons, removing 473 bushes from 154 acres.

COTTON INSECT INVESTIGATIONS

Boll worm breeds through winter at Brownsville, Tex.--On January 27, 1935, 5 days after the temperature had been as low as 24° F. at Brownsville, Tex., T. C. Barber collected from ears of corn that had been partially protected from the frost three larvae of Heliothis obsoleta Fab. These specimens were transferred to cotton bolls in the out-door insectary. They fed readily on the cotton bolls. One died soon after collection but the other two developed normally and entered the soil to pupate. One pupa was accidentally injured and died. The remaining specimen emerged as a moth on March 10, 1935. It had entered the soil as a larva on February 8; therefore 30 days were spent underground in the prepupal and pupal stages.

Boll worm emergence from hibernation at College Station, Tex.--R. K. Fletcher, of the Texas Experiment Station, cooperating with this Bureau, reports the emergence on March 20, 1935, of one boll worm moth from cages in which approximately 400 boll worms entered the soil last fall. This is the earliest record of emergence of a boll worm moth at College Station, where boll worm hibernation studies have been made for several years. In the field alfalfa plants were examined almost daily during March. The first egg was found March 22. Eggs were found almost daily after that and first-instar boll worms were found on alfalfa on March 28 and 29. During April 16,500 corn plants were examined for oviposition and plant injury. Corn planted at different dates on black upland, sandy-loam upland, and Brazos River bottom land was examined from the time it came up. The corn was not attractive to ovipositing moths until it was from 8 to 10 inches high. So far this season, more eggs have been found on the upland corn than on the bottom-land corn. This is in accordance with moth emergence, which was earlier and heavier from upland soils.

Overwintering pink bollworm population.--A. J. Chapman and assistants of Presidio, Tex., have reported an examination of field samples to determine the numbers of pink bollworm larvae hibernating in different environments. Samples of soil, surface trash, and forms on the plants were collected after the final picking last November and December. The soil was washed through sieves immediately after being collected and the material separated was dried and stored, together with the surface and plant material, until January, when it was examined. Sixteen fields were sampled, 8 of which were also examined last year. The numbers of pink bollworms in different environments in these 8 fields in 1933 and 1934 were as follows:

Location	Square yards examined		Larvae per square yard					
			On stalks and surface		In soil		Total	
	1933	1934	1933	1934	1933	1934	1933	1934
	No.	No.	No.	No.	No.	No.	No.	No.
Gray #1----	7.0	5.0	8.0	11.0	2.3	0.8	10.3	11.8
Gray #3----	5.0	5.0	39.2	21.8	3.0	3.6	42.2	25.4
Adobes-----	10.0	5.0[1]	21.8	27.6	4.5	3.3	26.3	30.9
Sparks------	10.0	5.0	3.1	0.6	1.1	0.2	4.2	0.8
Fortine----	10.0	10.0	4.5	0.4	0.3	0.1	4.8	0.5
Baldwin----	5.0	5.0	12.6	14.4	2.2	0.6	14.8	15.0
Pena--------	5.0	5.0	1.6	17.0	1.4	1.2	3.0	18.2
Alvarado---	5.0	5.0	6.0	36.0	1.0	0.2	7.0	36.2
Average--	7.13	5.63	12.1	16.1	1.97	1.25	14.07	17.35

[1] 5 sq. yds. of surface and stalks equal 10 sq. yds. of soil.

The wide variation in the worm population in different fields may be attributed to such factors as degree of infestation, extent of late fruiting, and cleanliness of the cotton when picked. There appears to be no correlation between the population on the plants and in the soil. The soil population, as determined by these examinations, varies somewhat with the type of soil. In the heavier soils there are frequently large cracks and the infested material that drops into these cracks is considered part of the soil population, along with the larvae that go into the ground and spin cocoons. There was an average of 16.1 worms per square yard, or 93.2 percent, on the plants and surface trash and 1.25 worms, or 6.8 percent, in the soil. There was a higher worm population on the plants and surface trash and a lower soil population than last year. One field was selected for examinations to determine the mortality during the winter. The soil was left undisturbed and samples collected and examined the first of each month showed the following numbers of live worms per square yard: 7.1 larvae on January 1; 5.6 on February 1; 4.4 on March 1; and 1.3 on April 1. These examinations show a considerably greater survival than was found for similar dates last year.

Storage of pink bollworms.--L. W. Noble, W. T. Hunt, and L. C. Fife, Presidio, Tex., have reported on a satisfactory method of storing overwintering pink bollworm larvae. During the cotton-ginning season last fall the worms were collected from gin trash and allowed to spin cocoons between sheets of paper, where they remained over winter or until needed for parasite-breeding work. Paper towels were placed in large garbage pails with tight-fitting covers, between which the worms spun up. Several hundred worms were placed on a layer of the towels in the cans and another layer of the towels was placed over them. This was repeated daily until the cans were filled with layers. The cans containing the worms were allowed to remain in the insectary at normal temperature. Some of these worms were of the short-cycle type and completed development. Some died from mechanical injury. A high percentage, however, lived over winter and were found to be in excellent condition as hosts for parasite breeding. Rather light cocoons were spun and when the sheets of paper are pulled apart most of the worms are left bare, making them easily accessible.

Life cycles of Microbracon brevicornis Wesm. and M. hebetor Say.--L. W. Noble, of Presidio, has been breeding M. brevicornis as a parasite of the pink bollworm. The original stock was imported from Europe and had been bred for a number of years on the European corn borer and for the last 2 years on pink bollworm. As this material had been bred continuously in the laboratory for several years, it was decided to import a stock of the pink bollworm parasite from Egypt to determine whether there were any notable biologic differences in the supposed two strains of the same species. Specimens of the Egyptian form received were submitted to C. F. W. Muesebeck, of the National Museum, for identification and were determined by him as M. hebetor and not M. brevicornis. M. hebetor is a normal parasite on insects attacking grain and other stored products. Before it was known that the material introduced from Egypt was M. hebetor, life-history studies under identical laboratory conditions were made. All the records were made on pink bollworm hosts, at a practically constant temperature of 78° F., and relative humidity of 65 percent. In M. brevicornis the average number of eggs deposited was 254, with a maximum of 610, whereas with M. hebetor the corresponding figures are 264 and 900. The average number of eggs deposited per day and the maximum were 12 and 36, respectively, for M. brevicornis and 16.6 and 39, respectively, for M. hebetor. It will be noted that these closely related species also have very similar life cycles, especially in the developmental periods of the immature stages. The greatest variations occur in the longevity and oviposition periods.

Hibernation of Microbracon mellitor at Tallulah, La.--J. W. Folsom reports that from 94 cocoons of M. mellitor spun in the fall of 1934 adults did not begin to emerge until March 16, 1935, indicating that the species normally hibernates in cocoons. However, the winter may also be passed in the adult stage, or under favorable conditions breeding may continue throughout the winter. One female that emerged on October 31, 1934, was kept alive until April 2, 1935, or 153 days. This female had not been mated. On January 15 she laid an egg on a boll weevil larva in a gelatine capsule punctured with holes. The adult, a male, issued on March 19. On January 18 she laid an egg on a larva of Eurosta solidaginis Fitch, taken from a gall on a goldenrod and placed in a similar capsule. The parasite larva became full grown but spun no cocoon. The pupa was seen on March 21, 22, and 23 and a male emerged on March 24. It should be said, however, that this long-lived female was protected against severe cold by being kept in a room at temperatures slightly warmer than those out of doors. There is no evidence as yet that M. mellitor hibernates as an adult at Tallulah, although it probably does so farther south.

Push-type cotton-stalk shaver.--D. A. Isler, of the Bureau of Agricultural Engineering, working in cooperation with the members of this Bureau's Presidio laboratory staff, has filed an application for a public patent on the push-type stalk shaver developed for cleaning fields for pink bollworm control. For more detailed reports on this implement see Bureau of Entomology News Letter, No. 236, p. 17 (January 1934), and Bureau of Entomology and Plant Quarantine News Letter, Vol. II, No. 1, p. 16 (January 1, 1935).

Notes on cotton flea hopper.--Hatching of cotton flea hoppers from overwintering eggs began at Port Lavaca, Tex., on February 19, according to K. P. Ewing and R. L. McGarr. The emergence was light, however, during February and early March with the peak of emergence occurring from April 6 to 8. Through April 38,595 nymphs emerged, as compared to 22,887 from similar cages last year. Croton plants collected last September averaged 251 nymphs per 100 plants, whereas those collected from October 6 to November 3 averaged 1,226 per 100 plants. Most of the common weeds found in the community were used for determining their importance as host plants for egg laying. The average emergence from these, per 100 plants, was as follows: Croton capitatus, 2,717 nymphs; C. texensis, 1,945; C. monothogynus, 243; bitterweed, 55; bloodweed, 39; cocklebur, 17; cotton, 10; other miscellaneous weeds (8 species), 0. Flight screens to determine migration of flea hoppers were placed in operation on April 16 and during the remainder of the month an average of 36.6 flea hoppers were caught per screen. The corresponding figures were 6.5 in 1934 and 102.5 in 1933. The croton clean-up campaign during the winter of 1933-34 may explain the small number of hoppers collected in April 1934. Screens facing in different directions caught the following comparative numbers: East, 157; south, 115; north, 85; and west, 83. On a screen placed on an elevated tower, 10 flea hoppers were taken at altitudes of 21 to 24 feet, as compared to 19 taken at elevations of 3 to 6 feet in the same location.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Trap-plot cotton in the Big Bend area of Texas.--Cold nights and high winds have retarded the growth of the trap-plot cotton throughout the month. In the Castolon district the weather was a little more favorable, and as a result the two plots there made very good growth. Both plots began putting on squares the latter part of the month, and apparently they will be blooming around the 20th or 25th of May. In the Presidio district the cotton did not grow so fast. By the end of April the larger plants were about 6 inches high and should begin squaring about the second week in May.

A considerable quantity of stub cotton came up in one of the fields at Castolon. This was all grubbed out, with the exception of some 50 stalks that will be used for trap plots. There was also some scattered stub cotton in the Presidio district, and this was grubbed out, with the exception of about half an acre on one farm, where from 150 to 200 stalks were left as a trap plot. Squares were found on these stubs the first of May. This plot is located in the most heavily infested section, and consequently should give some very good results. The delayed-planting date of April 15 for the Big Bend was satisfactorily observed and we also received excellent cooperation from the farmers on the Mexican side in observing this date. By the end of April most of the cotton crop had been planted in the Big Bend area from the mouth of the Conchos River southward. Above the Conchos there has been practically no planting on either the American or Mexican side of the Rio Grande, because of insufficient water for irrigating. However, it now appears that the trap-plot cotton has sufficient margin over the field cotton to give good results.

Pink bollworm control work in Florida.--Throughout the month of April two inspectors have been engaged in wild-cotton eradication on the west coast of Florida. These men have been removing seedling plants missed during the regular clean-up, and also removing the few scattered mature plants. A total of 56 mature, 3,515 seedling, and 44 sprout plants were removed. This work should prove of considerable value in preventing the fruiting of any plants before eradication work is resumed next season. Two other inspectors have been engaged in making a survey of the numerous keys which make up the Key West group, and they removed several small colonies found as a result of this survey. During the month between 250 and 300 keys were covered, and 150 mature and 399 seedling plants were removed. Many of the keys covered can now be eliminated from any further consideration, as they contain no high ground upon which wild cotton could grow. These men experienced considerable difficulty because of extreme shallow water in the area in which they were operating. They often had to pole their skiff 2 or 3 miles, when the water was too shallow to permit operating the outboard motor. Only 4 or 5 small colonies of wild cotton were found as a result of the survey.

Laboratory inspection.--Inspection at the various field stations continues to go forward satisfactorily. Only one specimen of the pink bollworm was found in the material inspected during April, this being in the Pecos Valley of New Mexico. The negative results in the Thurberia weevil area of Arizona are gratifying, as the previous month's inspection had indicated that there might possibly be a light infestation in the top crop of bolls over the area. The material inspected at the various stations had been collected within and at points just outside the regulated areas which would be most likely to show infestation.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Bean varieties approximately equal in susceptibility to spray injury, tests indicate.--R. W. Brubaker and N. F. Howard, of the Columbus, Ohio, laboratory, report that in tests conducted with 32 varieties of snap beans during the summer of 1934, spraying with magnesium arsenate and synthetic cryolite failed to disclose any appreciable differences in varietal susceptibility to injury by either of these insecticides. Incidentally, some of the varieties under observation were apparently much preferred to others by the Mexican bean beetle.

High concentration of anabasine sulphate gives fairly satisfactory results against squash bug.--H. C. Mason and R. W. Brubaker, Columbus, report that at a dilution of 1-100, anabasine sulphate (40 percent) killed a high percentage of adults and nymphs of the squash bug under both laboratory and field conditions. Under the latter, slight injury resulted to the margins of some of the squash leaves, but such injury was not serious. In combination with sulphonated oxidized gas oil (1-200), or miscible pine oil at the same dilution, the growing tips of the squash vines were seriously injured. The percentage of kill obtained with anabasine sulphate alone at the dilution of 1-200 was unsatisfactory and a dilution of 1-400 gave practically no kill. Powdered soap at the rate of 1 pound to 50 gallons of water, in combination with anabasine sulphate at any dilution, although tested only under laboratory conditions, greatly increased the percentage of kill.

Derris dusts economical in controlling Mexican bean beetle in Virginia.--L. W. Brannon, of the Norfolk, Va., laboratory, reports that in general the increases in yield of beans per acre due to treatment and the net profits per acre were greater as a result of the dust treatments than with the spray treatments, even though the cost of the dust applications was considerably greater than that of the spray. The plots treated with derris dusts gave such large increases in yield that derris was more economical in the end than some of the cheaper materials. The net profit from the use of cryolite (sodium fluoaluminate) was greater than from the derris-root spray, owing to the low cost of the former. The general results of the experiment demonstrated that a derris-root dust mixture containing 0.75 percent rotenone, with talc as a diluent, was highly effective in controlling the Mexican bean beetle, and that this dust mixture could be used profitably on snap beans bringing as low as 45 cents per bushel.

Oil sprays effective against rhododendron white fly.--Randall Latta, of the Sumner, Wash., laboratory, continuing his studies with the white fly Dialeurodes chittendeni Laing, on the basis of final observations on sprays applied January 31, February 11, and February 26, 1935, respectively, reports as follows: "It was possible to make final observations on sprays applied on these dates. As noted in previous reports, three oils were used--a dormant oil of 74-76 sulphonation and 100-110 viscosity, a heavy oil of 94 sulphonation and 90-100 viscosity, and a commercial oil emulsion, specifications unknown. These were emulsified by the casein-ammonia method. The counts which are given below were all made on April 26. The mortality following application of the spray is shown below.

Oil	Date	Dilution	Total		Average mortality
			Dead	Alive	
		Percent	Number	Number	Percent
Dormant	Jan. 31 A	1	356	63	84.9
Heavy	do.	1	337	12	96.5
Dormant	Jan. 31 B	1	46	0	100.0
Heavy	do.	1	69	3	95.8
Commercial emulsion	Feb. 11	1+	180	9	95.2
Heavy	Feb. 26	2	420	0	100.0
Commercial emulsion	do.	1+	1,392	196	92.9

"These results show favorable control from the use of oil sprays. The figures are consistent with those given in the previous report."

Naphthalene-treated gladiolus corms lose less weight in storage than do untreated corms.--R. H. Nelson, of the greenhouse-insects laboratory, Washington, D. C., continuing his tests on the control of gladiolus thrips in further experiments with gladiolus corms, both in warm and in cool storage, states that corms treated with naphthalene did not lose as much weight as did untreated corms, also that the corms in warm storage lost more weight than did those in cool storage. This was true even after the naphthalene had been removed. The difference was not great, and the significance is doubtful, but it indicates a continual reduction in the physiological activity of the corms from exposure to the naphthalene.

Mites killed by hot-water treatment.--F. F. Smith, of the greenhouse-insects laboratory, Washington, in two preliminary tests conducted in cooperation with W. H. Larrimer, of the Division of Cereal and Forage Insects, reports that the following minimum hot-water treatments killed the *Tarsonemus bancrofti* Michael on from one to five leaf sheaths on the canes: 30 minutes immersion at 110° F.; 30 minutes immersion at 115°; 15 minutes immersion at 120°. *T. randsi* n. sp., which was present among the colonies of *T. bancrofti*, was much more resistant than *T. bancrofti*, requiring the following temperatures and durations to effect complete mortality: 60 minutes at 110° F.; 30 minutes at 115°(under one sheath *T. bancrofti* was killed by a 15-minute immersion); and 10 minutes at 120°(*T. bancrofti* was killed under one sheath).

INSECTS AFFECTING MAN AND ANIMALS

Longevity of unfed larvae of the winter tick and oviposition.--At Ames, Iowa, it has been found that 100 percent of several hundred unfed seed ticks of *Dermacentor albipictus* Pack., kept in an insectary without artificial heat, were still alive after a period of 298 days, but that all except about 1 percent died after 328 days. Engorged females removed from horses on January 19 at Sonora, Tex., and kept at a room temperature which never dropped below 40° F. began laying eggs on March 27 and the eggs began hatching May 2. Females obtained from the same hosts at the same time, but kept in an open insectary where the temperature reached a minimum of 10° F., did not begin oviposition until April 10. The eggs had not yet hatched on May 2.

Imported blowfly parasite apparently established in Texas.--Attempts at Uvalde, Tex., for the past few years to establish *Alysia ridibunda* Say, a native hymenopterous parasite, have apparently been successful. These insects, which attack the larvae of blowflies breeding in carcasses, were able to pass the winter in the Uvalde locality and have been recovered this spring in from 30 to 50 percent of the meat baits used for this purpose. Since September 1, 1934, 32,824 of this species have been liberated.

Conference on malaria and mosquito-control problems.--E. L. Bishop, director of health and sanitation of the Tennessee Valley Authority, called a meeting of the advisory committee to discuss malaria and *Anopheles* mosquito control in the areas affected in connection with the power projects to be developed by impounding the Tennessee River. The members of the advisory committee are M. F. Boyd, of the Rockefeller Foundation, T. H. D. Griffitts and J. A. LePrince, of the United States Public Health Service, and W. V. King, of this Bureau. The meeting was held at Sheffield, Ala., on April 25 to 27. The control areas under consideration are the present Wilson Lake, Wheeler Lake now under construction, the Pickwick Landing project, which is not started but is planned for completion in 1938, and the Norris Dam area. The total area in these four projects to be covered by the impounded water will amount to considerably over 124,000 acres and will have a total shore line of about 2,600 miles. Systematic malaria and mosquito surveys, the use of airplanes and boats for the application of larvicides, a house-screening program, and the distribution of free medicine are among the several methods to be employed to prevent malaria in the affected localities.

FOREIGN PARASITE INTRODUCTION

Recent importations from the European parasite laboratory at Hyeres, France, include *Trichacis remulus* Walker, parasitic in the larvae of the Hessian fly; *Bathyplectes corvina* (Thoms.), a larval parasite of the alfalfa weevil; and a small consignment of *Tetrastichus xanthomeleanae* Marchal, an egg parasite of the leaf beetle.

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Two living larvae of the Mediterranean fruit fly were intercepted last November at New York in an orange in stores from Portugal. Living adults of *Xylothrips flavipes* Ill. were taken at San Francisco in logs of Philippine mahogany in cargo from the Philippines. The bostrichids were boring in the heart wood. Living larvae of the elaterid *Melanotus rufipes* Hbst. were found last January at Washington, D. C., with packing around Helleborus plants in the mail from England. *Kuwanina parvus* (Mask.) arrived on March 15, 1934, at Honolulu, Hawaii, on a cherry tree in cargo from Japan. This is the first interception record of this coccid in our files. Adults of the chrysomelid *Phyllotreta* *cruciferae* Goeze were taken in ship's stores from Europe on two occasions in 1934--at Philadelphia on a leek (*Allium porrum*) from France, and at New York with cabbage from England. Living and dead adults of the weevil *Apion cerdo* Gerst. were intercepted last November at Washington, D. C., in seed of *Vicia* sp. in the express from Issyk Kul, U. S. S. R. This species was taken at Washington, D. C., in 1930 with vetch seed from Spain. The leaf beetle *Metaxyonycha panamensis* Jacoby was found at San Pedro, Calif., with bananas in cargo from Panama. Fourteen living larvae of *Psylliodes chrysocephala* L. arrived last January at New York in the roots and stems of turnips in stores from France. Four nymphs, apparently of *Megophthalmus scanius* Fall., were taken at Baltimore with shamrocks in the mail from Ireland. Living larvae of the West Indian sweetpotato weevil (*Euscepes batatae* Waterh.) were intercepted at Mobile, Ala., in sweetpotatoes in stores from Aruba, Dutch West Indies. A living specimen of *Mecistorhinus tripterus* Fab. arrived at Charleston, S. C., with banana debris in cargo from Honduras. Five living adults of *Platypus lucasi* Chapu. were intercepted at Seattle, Wash., in logs in cargo from the Philippines. This species is not recorded from the continental United States.

Pathological interceptions of interest.--*Arthrobotrys superba* Cda. was intercepted on March 11 on *Ficus* sp. from Barbados, British West Indies, at New York (first interception). *Bremia lactucae* E. Regel was intercepted on February 14 on lettuce from France at New York. The only previous interception of this disease was made last year, same host, origin, month, and port. *Colletotrichum atramentarium* (Berk. and Br.) Taub. was intercepted at New Orleans on April 8 on eggplant (first interception from Argentina). *Colletotrichum omnivorum* Hals. was intercepted from Germany on March 4 at New York on *Aspidistra* sp. (first interception from Europe). *Colletotrichum peregrinum* Pass. was intercepted at Seattle on February 19 on *Fatsia japonica* from Japan (first interception). *Coryneum* sp. (perhaps *C. rhododendri* Schw.) was intercepted on *Rhododendron* sp. from England on March 18 at Seattle (first interception of *Coryneum* on rhododendron). *Discosia artocreas* (Tode) Fr. was intercepted at Seattle on peony from Japan on November 13, 1934 (first interception). *Gloeosporium pelargonii* Cke. and Mass. was intercepted at New York on February 18 on a geranium from Puerto Rico (first interception). *Gloeosporium sansevieriae* Verwoerd and Duplessis was intercepted on sansevieria from Puerto Rico on February 4 at New York (first interception). *Gloeosporium* sp., unlike any species described as occurring on *Camellia*, was intercepted at Seattle on March 5 on *Camellia japonica* from Japan. *Glomerella cingulata* (Ston.) Spauld. and Schrenk was intercepted for the first time on papaya from Panama on March 27, at New York. *Heterosporium* sp. (probably *H. gracile* Sacc.) was intercepted at Seattle on March 18 on *Schizostylis* sp. from England. *Leptosphaeria* sp. (no species is reported on wistaria) and *Microdiplodia wistariae* Grove (only one previous interception) were found on *Wistaria multijuga* from Japan on March 18 at Seattle. *Macrophoma* sp. (perhaps *M. aucubana* Sacc. but spores longer than in description) was intercepted at Seattle on February 20 on *Aucuba japonica* from Italy. *Mycosphaerella schoenoprasi* (Rabenh.) Schroet. was intercepted on April 11 at Philadelphia on leeks (first interception from Spain). *Pestalozzia* sp. (none found reported on wistaria) was intercepted on March 18 at Seattle on *Wistaria multijuga* from

Japan. *Phoma betae* (Oud.) Frank was intercepted at Philadelphia on April 10 on chard from Italy (first interception from Italy) and on April 16 on beets from Chosen (first interception from Asia). *Phoma sanguinolenta* Rostrup was intercepted on April 1 at Port Arthur on carrots from France (first interception). *Phomopsis* sp. (no species reported on *Coelogyne*) was intercepted on March 6 at New York on *Coelogyne dayana* from Jamaica. What appeared to be *Phyllosticta pisi* West was found on peas infected with *Mycosphaerella pinodes* (Berk. and Blox.) R. E. Stone intercepted at New York on April 17 on peas from France. The material was insufficient for study. *Phyllosticta* sp. (somewhat similar to *P. cucurbitacearum* Sacc.) was intercepted at New York on February 6 on cucumbers from Cuba (first interception of a *Phyllosticta* on this host). *Plasmopara viticola* (Berk. and Curt.) Berl. and De Toni was intercepted on grapes from Argentina on March 22 at New York (first interception from Argentina). *Pseudopeziza medicaginis* (Lib.) Sacc. was intercepted on alfalfa found in boxes of pears from Argentina on February 25 at New York (first interception positively identified). The same fungus was found on shamrocks from Ireland intercepted at New York on March 13. *Pyrenophora ciliolata* Moesz. was intercepted on March 18 at Seattle on *Primula facchinii* from England (first interception of the genus). *Sclerotium oryzae* Catt. was found on several lots of rice straw from Spain used as packing in cargo reaching New York on February 1 and 26. This disease has been intercepted before but this is the first time it has been possible to get it determined. *Scoleconectria* sp. and *Tetracium* sp. were intercepted on March 15 at New York on citrus leaves from Brazil (first interceptions of these genera). *Septoria endiviae* Thuem. was intercepted at New York on April 12 on chicory from Italy (first interception). *Septoria* sp. (different from species described on primulas) was intercepted on March 18 at Seattle on *Primula salisburgensis* from England.

Areca diseases.--Diseased fruits of *Areca catechu* from the Philippines found in baggage at Seattle on February 19 were infected with *Gloeosporium catechu* Syd. (first interception), another species of *Gloeosporium* with spores much smaller than any species found described on *Areca*, and *Macrophomella* sp. (possibly same as *M. pandani* Died. on fruits of pandanus but has larger spores). This is the first interception of the genus *Macrophomella*. *Areca catechu* is the source of "betel nuts", chewed by the natives in tropical countries, as well as of a dye and medicines.

New species of nema intercepted.--On April 15 an inspector at Boston found a diseased yam from Port Harcourt, Nigeria, in a liquor locker in the crew's quarters of a vessel. Examination in Washington disclosed the presence of numerous parasitic nemas in the brown lesions. This nema is an undescribed species of *Hoplolaimus*. It will be recalled that *Hoplolaimus bradys* was described from a yam intercepted from Jamaica. According to Dr. Steiner members of this genus appear to be parasitic in the roots of a number of plants in Africa. On April 17 an inspector at New Orleans found a diseased potato from Cuba in stores. Examination in Washington disclosed an interesting array of nemas which have been determined as *Aphelenchoides* n. sp. (apparently the primary cause of the disease), *Cephalobus* n. sp., and *Anguillulina* sp.

Pink bollworm in cotton from Mexico.--Fifty-five locks of seed cotton were taken from a truck crossing the border from Mexico at Presidio, Tex., on April 16. Examination determined that it was infested. The search was short as the first four locks yielded one live and one dead pink bollworm. The entire lot was forthwith destroyed.

Mediterranean fruit fly intercepted from Palestine.--Although Ceratitis capitata Wied. has long been known to occur in Palestine, it was found for the first time in the course of port inspection in any host fruit from that country on March 7 at New York, when three living and seven dead larvae were discovered in 2 oranges of a sample taken for examination from a lot of eight cases (880 fruits) in ships' stores.

Clove-stuffed oranges.--Europeans sometimes stick cloves thickly all over a fresh orange and after it has dried out it is placed in a trunk or drawer to diffuse the agreeable combination of clove-and-orange aroma among the contents. Recently several commercial shipments of these clove-studded oranges have been made from England, the fruit being presumably of Spanish origin. When thoroughly dried out, the finished product is regarded as without risk of harboring fruit fly larvae, but some of these shipments have arrived in this country in an imperfectly dried condition and their entry had to be refused.

DOMESTIC PLANT QUARANTINES

White pine blister rust quarantine amended.--The State of Minnesota recently placed a regulation setting aside certain areas for the production of five-leafed pines within which no currant or gooseberry plants may be grown. Federal quarantine no. 63 was accordingly amended, effective March 15, requiring shippers to secure a permit before shipping Ribes plants to Minnesota or to the nine other States maintaining similar control areas.

Citrus canker in new location.--Recent inspections in the vicinity of Alvin, Tex., have resulted in locating citrus canker on 8 properties. Four of these showed old infections on Citrus trifoliata and were found in an area from which no citrus canker has recently been reported. During the winter and spring inspections, carried on cooperatively with the Texas Department of Agriculture, over 20 infected properties have been located in the Galveston-Brazoria area. Infections were found on Citrus trifoliata growing in abandoned orchards and woodlands. All infected trees, and in most instances all other Citrus trifoliata trees growing on the property, were destroyed.

Inspection for phony peach disease.--Inspection was begun on April 16, field experiments having indicated that conditions were satisfactory for active work. Inspections have been made thus far in four counties in Georgia. The removal of diseased trees early in the season eliminates the cost of caring for worthless trees and is indorsed by the growers, who are furnishing more labor for tree removal than in previous seasons.

Summary of narcissus inspection.--A record of the inspection in the various States during the calendar year 1934 has been summarized and published as B. E. P. Q. circular 373, dated April 23, 1935. The figures were taken from the reports sent to this Bureau by the nursery inspectors of the various States who acted as Federal collaborators in such inspections.

State action on narcissus.--The Oregon Department of Agriculture placed a quarantine on April 8, requiring as a condition of entry of narcissus bulbs, certification based on two inspections during the season and on hot-water treatment for infestation. Word has been received that in Florida, Virginia, and Michigan inspections will be made the same as when the Federal quarantine was in force and that in Maryland and Pennsylvania the inspection of narcissus plantings will be continued as part of the general nursery-inspection program. An unconfirmed report states that the Texas Department of Agriculture has placed special regulations with reference to narcissus bulb shipments.

BEE CULTURE

Pollen reserves in Colorado.--C. L. Farrar, of the Intermountain States Bee Culture Field Laboratory, Laramie, Wyo., assisted by R. G. Richmond, deputy State entomologist of Colorado, reports results of the pollen-reserve surveys in apiaries of two commercial beekeepers in the vicinities of Greeley and Brush, Colo. The colonies of the combined apiaries totaled 2,500. Two hundred and twenty-nine colonies in 6 yards were examined for pollen reserves in September 1934 (see December 1, 1934, News Letter) and were again checked for general conditions in April 1935. The average reserve pollen per colony ranged from 89 to 334 square inches of cells containing pollen in the colonies of the 6 yards in September 1934. The pollen variation between colonies ranged from practically none to over 350 square inches in 5 of the 6 yards; 51.2 percent of all colonies examined in April 1935 showed a general condition directly in proportion to the amount of reserve pollen present in the fall; 18.5 percent were grouped as border-line cases; 17.6 percent showed a general condition inversely related to the pollen reserves; 6.5 percent were evidently abnormal colonies, resulting from excessive drifting; 6 percent were queenless; and 5 colonies were dead and were therefore not considered in determining the percentages. Drifting between all colonies is an important factor affecting colony conditions in all commercial apiaries. It is considered significant that from 51.2 to 69.7 percent of the colonies showed a general condition trend in line with experimental results covering three seasons on controlled isolated colonies whose surviving populations in the spring, as compared with equivalent colonies, are directly proportional to the amount of pollen in reserve the previous fall. The experiments showed that the average reserve pollen per colony in the region in question is below the optimum requirement. Any method of management designed to increase the reserves should be beneficial to efficient management of overwintered colonies.

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IDENTIFICATION AND CLASSIFICATION OF INSECTS

New locality records for two species of weevils.--Four specimens of the cotton boll weevil (Anthonomus grandis Boh.), recently submitted by André Audant, Port-au-Prince, Haiti, are the first Haitian specimens of this species to be received by the National Museum. The species has long been known from Cuba. Two specimens of the pepper weevil (Anthonomus eugenii Cano), sent in by J. R. Watson, are stated to have been "infesting peppers in the Bradenton section of Florida." It may be mentioned also that the series of the pepper weevil represented in the National Museum includes specimens labeled "Mansura, Louisiana, June 29, 1904." As far as known, both Louisiana and Florida are unreported localities for the weevil.

Another European moth found in the United States.--Among specimens of Lepidoptera received for identification from the gypsy moth laboratory of the Bureau, was one small moth which has been identified by Carl Heinrich as Laspeyresia coniferana Ratz. According to the associated data, this specimen was reared from larvae found in Pinus resinosa collected at Cross River, N. Y., on June 27, 1934. The species apparently has not previously been reported from the United States.

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